# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

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In Reply Refer To:
**01EWFW00-2016-I-0850**

Michael J. Lidgard
Manager, NPDES Permits Unit
Region 10
U.S. Environmental Protection Agency
1200 Sixth Ave., Suite 900
Seattle, Washington 98101-3140

Dear Mr. Lidgard:

Subject: NPDES Permit (WAG 130000) for Federal Aquaculture Facilities and Aquaculture facilities Located in Indian Country within the Boundaries of the State of Washington

This letter is in response to your December 21, 2015 request for our concurrence that reissuance of a National Pollution Discharge Elimination (NPDES) Permit "may affect, but is not likely to adversely affect" the bull trout (*Salvelinus confluentus*) and bull trout critical habitat. We received your letter, Biological Evaluation, and additional materials providing information in support of these determinations on December 22, 2015.

The U. S. Environmental Protection Agency (EPA) proposes to reissue a general wastewater discharge permit for discharges from 25 federal aquaculture facilities and aquaculture facilities located in Indian Country in Washington State. The EPA evaluated effects of the following 7 chemicals commonly used at hatchery facilities, though not all chemicals are used at all hatcheries: chloramine-T, chlorine, formalin, hydrogen peroxide, potassium permanganate, povidone-iodine, and sodium chloride. Potentially harmful degradation byproducts of these chemicals were also evaluated. The EPA believes that these 7 chemicals have the potential to be released to receiving waters where bull trout may be present. In addition, the EPA considered 17 other chemicals that may be used at hatcheries, and determined that these either: 1) are not released into surface waters; 2) are used so infrequently, used in such low volumes, and/or have such low toxicity that their discharge into surface waters is either not measureable or is inconsequential; or, 3) are completely non-toxic (Shephard et al. 2015, pp. 40-43). These chemicals were not considered further in the Biological Evaluation.

The EPA has determined that the action will have "no effect" on the following species: short-tailed albatross (*Phoebastria albatrus*), western snowy plover (*Charadrius nivosus nivosus*), Oregon spotted frog (*Rana pretiosa*), and marbled murrelet (*Brachyramphus marmoratus*). The determination of "no effect" to listed resources or critical habitat rests with the action agency. The U.S. Fish and Wildlife Service (Service) has no regulatory or statutory authority for concurring with a "no effect" determination, and no consultation with the Service is required. We recommend that the EPA document their analysis on effects to these species and maintain that documentation as part of the project file. This informal consultation has been conducted in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(ESA).

We believe that sufficient information has been provided to determine the effects of the proposed action and to conclude whether it would adversely affect federally listed species and/or designated critical habitat. Our concurrence is based on information provided by the action agency, best available science, and complete and successful implementation of agreed-upon conservation measures. The duration of this consultation is equivalent to the duration of the EPA permit, which is 5 years from when EPA issues the permit. Consultation on these actions must be reinitiated when EPA proposes to reissue the permit.

**Effects to Bull Trout**

Hatchery operations require the use and discharge of surface and well water into streams adjacent to the operating facilities. Hatchery water discharge may affect several water-quality parameters in the aquatic system. Waste products include uneaten food, fish waste products (i.e., fecal matter, mucus excretions, proteins, soluble metabolites such as ammonia), chemotherapeutic agents (e.g., formalin), cleaning agents (e.g., chlorine), drugs and antibiotics, nutrients (e.g., various forms of nitrogen and phosphorus), parasitic microorganisms, and algae. Some of these waste products are in the form of suspended solids and settleable solids, while others are dissolved in the water. Maintenance activities, such as vacuuming and removal of accumulated sediment on the bottoms of hatchery ponds and raceways, may temporarily elevate the concentration of some contaminants in the hatchery water system.

Under the previous permit, the hatchery facilities were required to limit release of suspended solids and settleable solids into surface waters. Required monitoring indicates that these measures are effective at substantially minimizing the release of uneaten food, fecal matter, and associated nutrients. The proposed permit contains the same limits and monitoring requirements. For these reasons, we do not expect suspended solids or settleable solids to measurably degrade or diminish habitat functions for bull trout prey resources or water quality.

For chemicals used at the hatcheries, there are limited data and substantial uncertainties associated with evaluating toxicity to listed aquatic species, including bull trout. These are discussed in several recent consultations completed by the Service concerning proposed water quality criteria in Oregon (USFWS 2012, p. 117 and Appendix 1, pp. 7-26) and Idaho (USFWS 2015, pp. 124-128, 136-138). In summary, there are no direct toxicity tests available specifically for bull trout, surrogates may not provide accurate indicators of toxicity to bull trout, there is a wide array of potentially relevant "endpoints" (or biological responses), and the exposure

scenarios evaluated may not provide accurate representations of actual exposures, among other issues. Our approach was to consider multiple lines of evidence and use best professional judgment in evaluating potential effects to bull trout.

The possibility that bull trout will be exposed to concentrations of hatchery chemicals high enough to result in measurable effects depends in part on chemical use patterns and expected bull trout presence. Most chemicals used at hatcheries are used infrequently and/or intermittently, such that these chemicals are absent from the effluent at most times. In addition, patterns in bull trout distribution and abundance vary spatially and temporally across Washington and the areas affected by the hatchery discharges. These were considered in our assessment of potential effects to bull trout.

Of the 7 chemicals evaluated by the EPA, povidone-iodine is the only one that is not used in water that flows through the hatchery (process water). Instead, povidone-iodine is commonly used to treat eggs after fertilization and, less commonly, to disinfect small equipment such as nets and boots. Egg treatment is infrequent (relatively few days per year) and uses small quantities of povidone-iodine. For gear treatment, containers of povidone-iodine solution are occasionally made available in certain areas of the hatchery and used as needed. This solution degrades over time as it sits out and gets used. For both types of uses, spent solution is most often disposed of on land. Any povidone-iodine solution that enters surface waters is expected to have very low concentrations of potentially harmful chemicals (e.g., elemental iodine), and to become rapidly diluted near the point of discharge. For these reasons, effects to bull trout from exposure to povidone-iodine are expected to be insignificant.

Sodium chloride is used at three hatcheries. It is used to calm fish and reduce stress during handling or transport, and/or to treat external parasites. This latter purpose mimics a natural behavior of salmonids, whereby fish move between waters of differing salinities to rid themselves of external parasites. Hatchery use concentrations of sodium chloride are 2 to 3 times above naturally-occurring concentrations in freshwaters, and volumes used are quite small compared to the total volume of water discharged by hatcheries. For these reasons, effects to bull trout associated with exposure to sodium chloride are expected to be insignificant.

For the remaining 5 chemicals, the EPA used the chronic no effect concentration (chronic NOEC) derived from surrogate species (usually species in the family Salmonidae) to assess effects of exposure to bull trout. The NOEC is defined as the highest concentration of a material in a standard laboratory toxicity test that has no statistically significant effect on the test organisms as compared with a control group. The EPA used standard procedures for estimating NOECs from other empirical data (such as acute LC50s, defined as the concentration necessary to kill 50 percent of exposed organisms). However, these procedures may not yield accurate NOEC estimates (USFWS 2012, Appendix 1, pp. 8-13). In addition, the EPA used their Interspecies Correlation Estimation (ICE) model to calculate NOECs for bull trout from surrogate species. The ICE model results must be interpreted with caution, however, as it may produce inaccurate results (USFWS 2012, Appendix 1, pp. 13-20; USFWS 2015, pp. 124-126). For example, in a limited analysis, USFWS (2015, pp. 124-126) found that the ICE model underestimated effects concentrations of toxic metals to two listed species, including bull trout, in 50 percent of trials (n = 6). In one trial, the ICE model underestimated the effect

concentration by a factor of 2.5. Therefore, for the purposes of this consultation, we considered estimated NOECs generally, and ICE-based NOECs specifically, as general rather than absolute indicators of chemical toxicity to bull trout, and considered these in combination with other factors to evaluate risk to bull trout.

The concentrations of chemicals in hatchery effluent depends on usage concentration, type of treatment (e.g., flow-through, static bath), and degradation and dilution prior to discharge. There are limited or no empirical data for concentrations of most chemicals in the effluent for most of the hatcheries included in this consultation. Therefore, we used data from other hatcheries to calculate estimates for the hatcheries included in this consultation. Calculation procedures and assumptions were intended to produce conservatively-high estimates of effluent chemical concentrations. For example, chemical degradation prior to discharge and dilution in effluent holding ponds were not factored into the estimates. Pulses of elevated chemical concentrations are likely to result from typical hatchery use patterns (e.g., when a treated raceway is flushed, or during a flow-through treatment), so we considered both short-duration (acute, on the order of hours) and chronic (on the order of days) exposure scenarios. We compared estimated end-of-pipe concentrations with chronic and acute ICE-based NOECs for bull trout.

With only one exception (acute exposure to chloramine-T), estimated end-of-pipe concentrations were less than the estimated NOECs. This suggests that estimated effluent chemical concentrations are at or near levels that would not be expected to injure bull trout. Actual discharge concentrations are likely lower when factoring in chemical degradation and holding pond dilution prior to discharge. Additional dilution will occur at and near the point of discharge as the effluent mixes with the receiving waterbody. Receiving waterbodies where bull trout could be directly exposed to hatchery effluent are large and/or have relatively high flow rates, including seasonal low flow periods, which would rapidly dilute hatchery chemicals very near the point of discharge. These factors are expected to offset the potential for and magnitude of inaccuracies in the toxicological estimation and assessment procedures described above. That is, even though the ICE-based NOEC for bull trout may be an imperfect measure of potential risk of injury to bull trout, the fact that actual exposure concentrations are likely to be well below the estimated NOECs suggests a very low risk of injury.

Additional factors that minimize risk to bull trout include the following:

- Most of the chemicals are used at 4 facilities or less. Only formalin (25 facilities) is widely used.
- Hatchery chemicals are not in continuous use. Rather they are used intermittently and sporadically, and thus are infrequently present in the effluent.
- All hatchery chemicals, except chloramine-T, degrade to harmless byproducts in the environment and do not bioaccumulate. A degradation byproduct of chloramine-T, p-TSA, persists in the environment but is not known to bioaccumulate. For these reasons, the presence of hatchery chemicals and their degradation byproducts in receiving waterbodies and their potential to move through the food web is limited.

- There are no other known discharges of these chemicals in the vicinity of the facilities considered in these consultations. Therefore, the discharges are not expected to contribute to existing chemical loads in the receiving waterbodies.
- Most facilities (18) included in this consultation are in areas where bull trout are not expected to occur or are in areas where there are few bull trout:
    - Three facilities (Quilcene National Fish Hatchery [NFH], Saltwater Park Sockeye Hatchery, and the Makah NFH) are in areas where bull trout are not known to currently occupy, and where effluent discharges cannot reach waters currently occupied by bull trout.
    - Five facilities (Carson NFH, Chief Joseph Fish Hatchery Program – Omak, Ford State Fish Hatchery, Spokane Tribal Hatchery, and Willard NFH) are in areas where bull trout are not known to currently be, but the receiving waterbody drains into waters that may contain bull trout. These facilities are more than 3.5 miles upstream from where the receiving waterbody drains into a large river (i.e., Spokane or Columbia Rivers). Based on known distribution, abundance, and movement patterns of bull trout that use the Spokane and Columbia Rivers, bull trout presence in these areas is expected to be very infrequent and in low abundance.
    - Four facilities (Chief Joseph Fish Hatchery Program - Hatchery on Columbia River, Colville Tribal Hatchery, Little White Salmon NFH, Spring Creek NFH) are on the mainstem Columbia River. Based on known distribution, abundance, and movement patterns of bull trout populations that use these general areas of the Columbia River, bull trout presence in the vicinity of effluent discharge is expected to be infrequent and in low abundance.
    - Four facilities (Battle Creek Pond, Lummi Bay Fish Hatchery, Tulalip Hatchery, and the Upper and Lower Tulalip Creek Ponds) discharge directly or indirectly into the nearshore areas of Puget Sound. Surveys and anecdotal accounts (e.g., incidental catch during hatchery broodstock collection) indicate that bull trout do not frequent the water bodies where these facilities are located and/or areas near the discharge. Bull trout presence in these general areas and in the immediate vicinity of the discharges is likely very infrequent and in low abundance.
    - The Keta Creek Hatchery Complex and Clear Creek Hatchery are in located in watersheds that may be used occasionally by migratory anadromous bull trout originating from other watersheds for foraging (Green River, Nisqually River). There are no spawning populations of bull trout in the Green or Nisqually Rivers. One of the facilities (Keta Creek Hatchery Complex) discharges to a small stream not known to be used by bull trout. Bull trout presence in the areas affected by hatchery chemical discharges from these two facilities would be also be very infrequent and in low abundance.

We could not rule out the possibility that concentrations of chloramine-T in effluent discharges could occasionally be high enough to cause injury to bull trout via acute exposures. However, chloramine-T is used intermittently and sporadically, and thus is infrequently present in the

effluent. In addition, chlormine-T is used at only 4 facilities (Ford State Fish Hatchery, Spokane Tribal Hatchery, Colville Tribal Hatchery, and the Keta Creek Hatchery Complex), all of which are in areas where bull trout are not expected to occur or where bull trout presence is very infrequent and in low abundance (see above). For 3 of these facilities (Ford State Fish Hatchery, Spokane Tribal Hatchery, Keta Creek Hatchery Complex), chloramine-T will be diluted and will degrade in receiving water bodies not known to have bull trout prior to draining into larger rivers that may occasionally contain small numbers of bull trout (Spokane and Green Rivers). One facility (Colville Tribal Hatchery) discharges directly into the Columbia River. Flow in all of these large rivers is relatively high, including seasonal low flow periods. Therefore, chloramine-T concentrations will become rapidly diluted near the point of discharge. For these reasons, it is extremely unlikely that bull trout would be exposed to concentrations of chloramine-T for durations or at concentrations that would elicit a measureable effect to their physiology or behavior.

Bull trout are opportunistic predators that feed on the eggs and juveniles of anadromous salmon and resident fish. They likely locate profitable feeding areas using chemical cues left in the water by their prey. Effluent from the hatchery likely contains relatively high concentrations of these cues, and could serve as a feeding attractant to bull trout, which is rewarded during the time when smolts are released, but may not be rewarded at other times. This "attractive nuisance" effect may keep bull trout from feeding as efficiently as they might if they were responding to feeding cues from natural food resources. However, because there is no foraging benefit associated with the point of discharge of effluents at hatcheries, we anticipate that bull trout will not linger at outfalls for very long and would seek more rewarding foraging options elsewhere. Bull trout are regularly documented below other hatchery facilities, especially during the time of year when juvenile fish are released from the hatcheries. However, beyond these anecdotal observations, there are no data or evaluations documenting the scope and magnitude of these effects, or the extent to which this phenomenon may be detrimental to bull trout. In addition there are only a small number of release events per year, greatly limiting the potential for the attraction to cause detrimental effects. These behavioral responses and the effects of exposure are not well studied, but appear to be minor.

For the reasons described above, we do not expect bull trout to be exposed to potentially harmful elements of hatchery effluent for durations or at concentrations that could result in injury or a significant impairment of their normal behavior. Therefore, we conclude that effects to bull trout growth, reproduction, and survival from discharge of hatchery effluent are insignificant.

**Effects to Bull Trout Critical Habitat**

The final revised rule designating bull trout critical habitat (75 FR 63898 [October 18, 2010]) identifies nine Primary Constituent Elements (PCEs) (75 FR 63931-2) essential for the conservation of the species. The 2010 designation of critical habitat for bull trout uses the term PCE. The new critical habitat regulations (81 FR 7214) replace this term with physical or biological features. This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified primary constituent elements, physical or biological features, or essential features. In this letter, the term PCE is synonymous with

physical or biological features or essential features of critical habitat. The proposed action may affect the PCEs listed below; however, effects to these PCEs are not expected to be measurable and are therefore considered insignificant or discountable:

*PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.*

As described above, discharge of solids and chemicals from hatchery facilities will be intermittent and at very low levels. Effects to water quality associated with effluent discharges will be limited to small, localized areas in the immediate vicinity of outfall pipes. These effects will not pose barriers to migration or preclude the function of this PCE. Therefore, effects to this PCE associated with impacts to water quality are considered insignificant.

*PCE3: An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

Invertebrates and fish in the immediate vicinity of discharge pipes may be affected by hatchery effluent. However, these areas are small and localized, and will not affect the overall abundance of forage available to bull trout. Therefore, effects to this PCE are considered insignificant.

*PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

For the reasons described in the Effects to Bull Trout section, the proposed action will have an insignificant effect on the PCE.

**Conclusion**

This concludes consultation pursuant to the regulations implementing the Endangered Species Act (50 CFR 402.13). Our review and concurrence with your effect determination is based on the implementation of the project as described. It is the responsibility of the federal action agency to ensure that projects that they authorize or carry out are in compliance with the regulatory permit and/or the Endangered Species Act, respectively. If a permittee or the federal action agency deviates from the measures outlined in a permit or project description, the federal action agency has the obligation to reinitiate consultation and comply with section 7(d).

This project should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this project.

This letter and its enclosures constitute a complete response by the U.S. Fish and Wildlife Service to your request for informal consultation. A complete record of this consultation is on file at the Washington Fish and Wildlife Office, in Lacey, Washington. If you have any questions about this letter or our joint responsibilities under the Endangered Species Act, please contact Mark Celedonia at (360) 534-9327 or Martha Jensen at (360) 753-9000, of this office.

Sincerely,

Martha L. Jensen

for Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

cc:
USEPA, Seattle, WA (C. Gockel)

**Literature Cited**

Shephard, B., A. LaTier, and C. Gockel. 2015. Biological Evaluation for Endangered Species Act Section 7 Consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service: NPDES General Permit WAG130000, Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country within the Boundaries of Washington State . United States Environmental Protection Agency, Seattle, WA.

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USFWS (United States Fish and Wildlife Service). 2015. Biological Opinion for the Idaho Water Quality Standards for Numeric Water Quality Criteria for Toxic Pollutants. Consultation Number 01EIFW00-2014-F-0233. Idaho Fish and Wildlife Office, Boise, ID.